

# Work Order ID 122843

**\*122843\***

Page 1

July-29-14 2:02:54 PM

Item ID: D212-664-201TRN

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Crosstube Turning Detail

Start Date: 7/29/14 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 8/15/14 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: ✓ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D212-664-241	Rev <u>E</u>

100 MORI SEIKI CNC LATHE LARGE 0.00

**\*100\***

Mori Seiki

Mori Seiki CNC Lathe Large

Memo

0.00

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA114

2-Turn first side as per Folio FA114

3-Blend transition lines only, \*\*do not sand whole tube\*\*:

FOLIO REV: AD

DWG REV: D

\*Use mill bastard file, brush file repeatedly with file card.

\*Do not use sandpaper coarser than 320 grit.

110

QC1- Inspect dimensions to dimension sheet 0.00

**\*110\***

QC

Quality Control

Memo

0.00

1/07/31

1/07/31

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July-29-14 2:02:54 PM

**\*122843\***

Page 2

Item ID: D212-664-201TRN Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Crosstube Turning Detail  
 Start Date: 7/29/14 Start Qty: 1.00 **\*1\*** Cust Item ID:  
 Required Date: 8/15/14 Req'd Qty: 1.00 **\*1\*** Customer:  
 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120	MORI SEIKI CNC LATHE LARGE	0.00				1	0		
<b>*120*</b>		0.00							
Mori Seiki	Memo								
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA114								
	2-Blend transition lines only, **do not sand whole tube**: *Use mill bastard file, brush file repeatedly with file card. *Do not use sandpaper coarser than 320 grit. FOLIO REV: <u>AD</u> DWG REV: <u>B</u> 3-Remove sand and plugs								
	4- scribe batch # and part # as per dwg								
130	QC1- Inspect dimensions to dimension sheet	0.00				1	0		
<b>*130*</b>		0.00							
QC	Memo								
Quality Control									

*mm'l*  
17/08/01

*mm'l*  
14/08/01

**Work Order ID 122843****\*122843\***

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July-29-14 2:02:54 PM

Item ID: D212-664-201TRN

Accept

**\*N900040100\***Setup Start **\*NS1\***

Revision ID:

Item Name: Crosstube Turning Detail

Stop **\*NS2\***

Start Date: 7/29/14 Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 8/15/14 Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	QC8- Inspect parts - second check	0.00							
<b>*140*</b>									
QC	Memo	0.00							
Quality Control									
145		0.00							
<b>*145*</b>									
Crosstubes	Memo	0.00							
Crosstubes	GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.								
150		0.00							
<b>*150*</b>									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT								
	2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								

# Work Order ID 122843

**\*122843\***

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Item ID: D212-664-201TRN

Accept

**\*N900040100\***

Setup Start

**\*NS1\***

Revision ID:

Item Name: Crosstube Turning Detail

Stop

**\*NS2\***

Start Date: 7/29/14

Start Qty: 1.00

**\*1\***

Cust Item ID:

Required Date: 8/15/14

Req'd Qty: 1.00

**\*1\***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

**\*NR1\***

QC:

Date:

SPC (Y/N):

Date:

Stop

**\*NR2\***

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

160

QC5- Inspect part completeness to step on W/O

0.00

**\*160\***

QC

Memo

0.00

Quality Control

16

9-89

14-8-21

DAS

38

9-89

170

Packaging

0.00

**\*170\***

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack  
Location: LB

JW

14-08-21

180

QC21- Final Inspection - Work Order Release

0.00

**\*180\***

QC

Memo

0.00

Quality Control

MLJ

14-08-22

MF

14-8-22

# Picklist Print

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Page 1

Work Order ID: 122843

**\*122843\***

Parent Item: D212-664-201TRN

**\*D212-664-201TRN\***

Parent Item Name: Crosstube Turning Detail

Start Date: 7/29/14

Required Date: 8/15/14

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec  
IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6006-129		Manufactured	No			120	Each	29.0000	1	1			

**\*D6006-129\***

Crosstube Material

**\*\***

Location

Loc Qty

Loc Code

LG003

29

103426

10

107875

18

75644

1

1

man.L 14/07/30



<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 122813
<b>Description:</b> Crosstube Assembly (205/212 High Aft)		<b>Part Number:</b> D212-664-241
<b>Inspection Dwg:</b> D212-664-241 <b>Rev:</b> DE		<b>Page 1 of 2</b>

### FIRST ARTICLE INSPECTION CHECKLIST

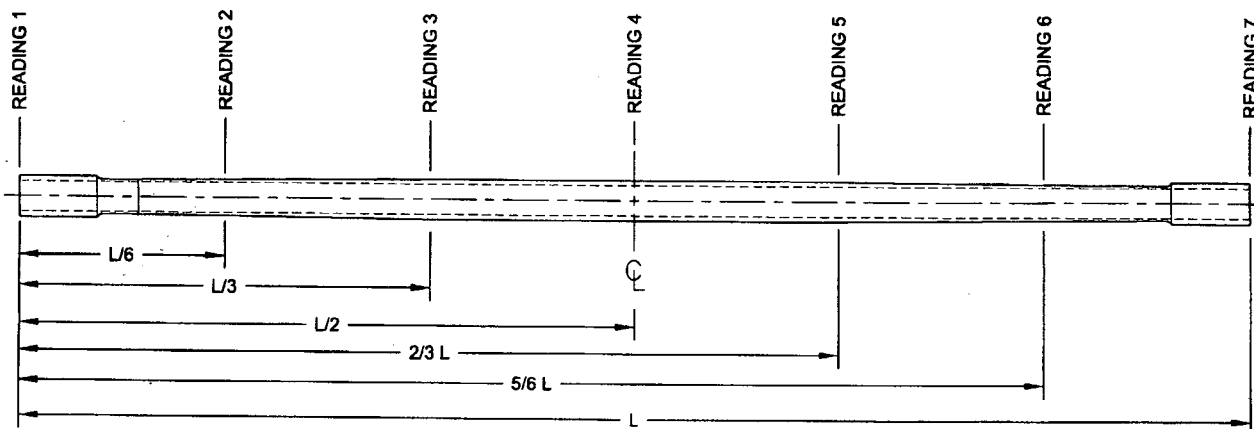
Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	.200	-		vern	CNC-08
	R0.063	+/-0.010	.063	-		RG	
	2.990	+0.005/-0.000	2.993	/		vern	CNC-08
	5.237	+/-0.030	5.240	/			
	2.600	+0.005/-0.000	2.604	/			
	2.686	+0.005/-0.000	2.690	/			
	2.770	+0.005/-0.000	2.773	/			
	2.854	+0.005/-0.000	2.857	/			
	2.938	+0.005/-0.000	2.940	-			
	3.021	+0.005/-0.000	3.024	/		mirr	CNC-05
	3.133	+0.005/-0.000	3.136	-			
	3.179	+0.005/-0.000	3.183	-			
SIDE B	0.200	+/-0.010	.200	-		vern	CNC-08
	R0.063	+/-0.010	.063	-		RG	
	2.990	+0.005/-0.000	2.990	-		vern	CNC-08
	5.237	+/-0.030	5.240	/			
	2.600	+0.005/-0.000	2.604	/			
	2.686	+0.005/-0.000	2.690	/			
	2.770	+0.005/-0.000	2.774	-			
	2.854	+0.005/-0.000	2.858	/			
	2.938	+0.005/-0.000	2.940	/			
	3.021	+0.005/-0.000	3.023	/		mirr	CNC-05
	3.133	+0.005/-0.000	3.136	-			
	3.179	+0.005/-0.000	3.183	-			
	124.362	+/-0.020	124.360	-		tape	LG-11





<b>DART AEROSPACE LTD</b>	<b>Work Order:</b>	122843
<b>Description:</b> Crosstube Assembly (205/212 High Aft)	<b>Part Number:</b>	D212-664-241
<b>Inspection Dwg:</b> D212-664-241 <b>Rev:</b> D/E		<b>Page 2 of 2</b>

### WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation $\Delta w$ (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L = 0"	.397	.403	.389	.388	.015	0.062"
READING 2 L = 20.5	.322	.306	.306	.327	.021	
READING 3 L = 41.5	.484	.494	.479	.486	.015	
READING 4 L = 62	.523	.535	.517	.515	.020	
READING 5 L = 82.5	.477	.488	.499	.487	.022	
READING 6 L = 103.5	.325	.308	.312	.328	.020	
READING 7 L = 124.362	.371	.417	.409	.373	.046	

#### Calibration Result

Actual Block Thickness: .762 - .750

Sitiescan 250 Measured Thickness: .766 - .750

<b>Measured by:</b> <u>mmg</u>	<b>Audited by:</b> <u>[Signature]</u>	<b>Preliminary Approval:</b>
<b>Date:</b> <u>14/08/01</u>	<b>Date:</b> <u>14-08-06</u>	<b>Date:</b>

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM	
D	10.08.03	Dimension 124.362 was 124.36	KJ	
E	12.06.04	Wall thickness form added	KJ	<u>[Signature]</u>

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2		D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6		2	D5018-1	SUPPORT
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
8	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

#### GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129  
FINISHED LENGTH = 124.362±0.020
- FINISH: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)  
d) PAINT OUTSIDE PER DART QSI 005 4.2  
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241/-241B = 44.2 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

#### MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

#### BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

#### ASSEMBLY

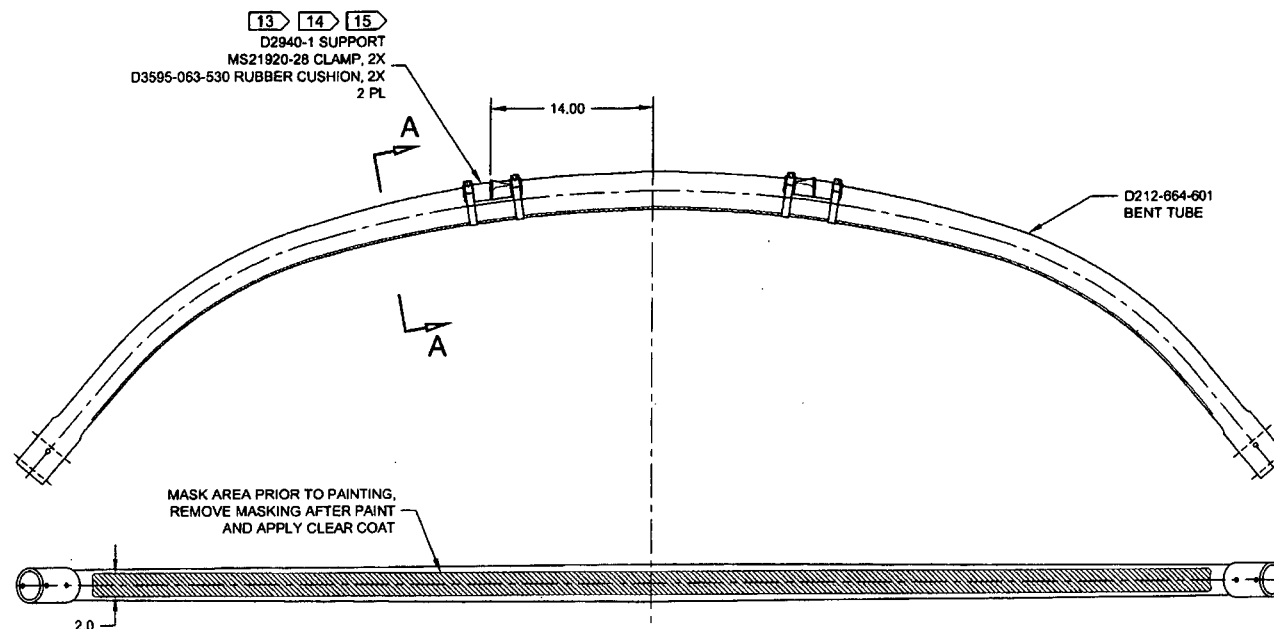
- INSTALL D2940-1 / D5018-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

122813

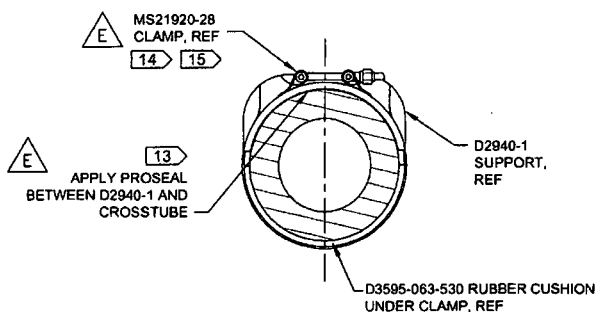
RELEASED

2014-05-26

E	D5018-1 WAS D2940-1 (-241B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (ZN B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-4), INCORP DEO D-1/2	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	08.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV	DESCRIPTION	BY	DATE
DESIGN	DP	DART AEROSPACE LTD	
DRAWN	DP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DW	DRAWING NO.	REV. E
MFG. APPR.	DP	D212-664-241	SHEET 1 OF 5
APPROVED	DP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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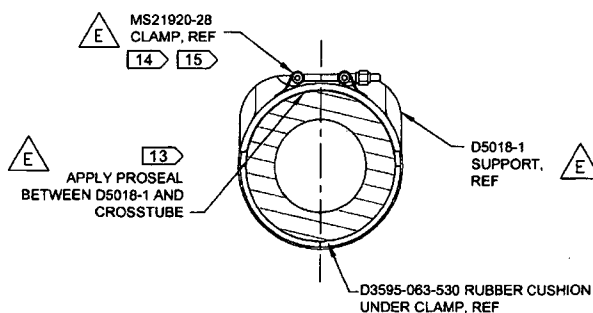
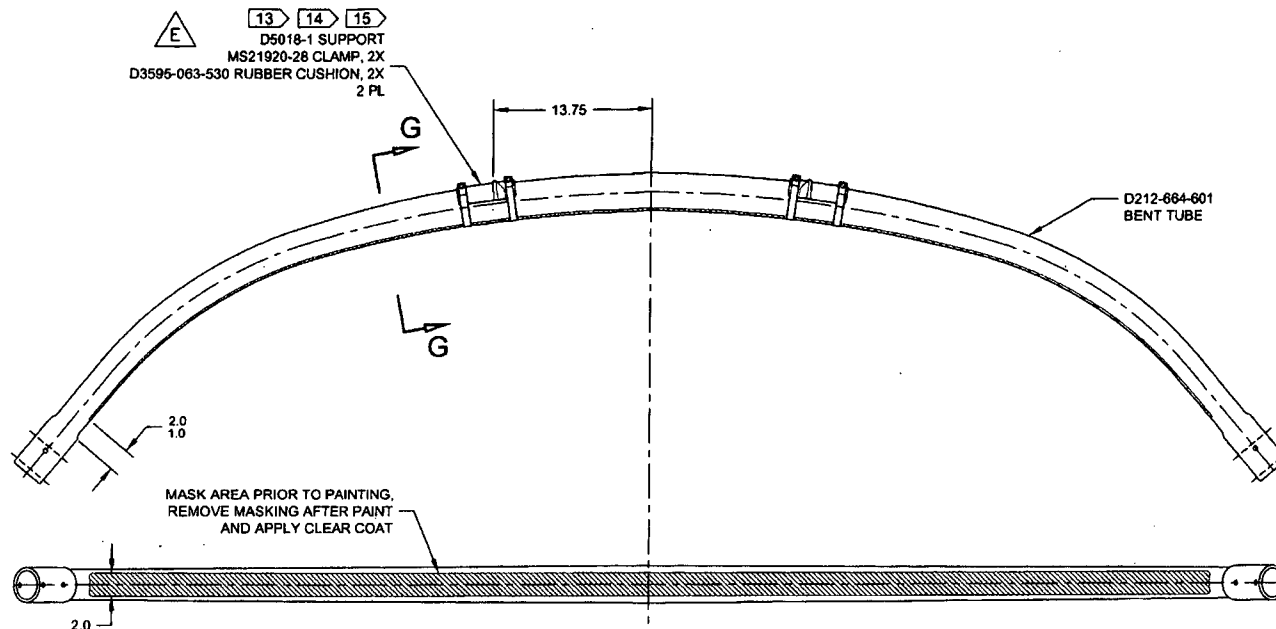
**D212-664-241  
ASSEMBLY DETAIL**



**SECTION A-A  
SCALE 4X**

**RELEASED**  
2014-05-26

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DRAWN	DL	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DL	DRAWING NO.	REV. E
MFG. APPR.	DL	D212-664-241	SHEET 2 OF 5
APPROVED	DL	TITLE	SCALE
DE APPR.	DL	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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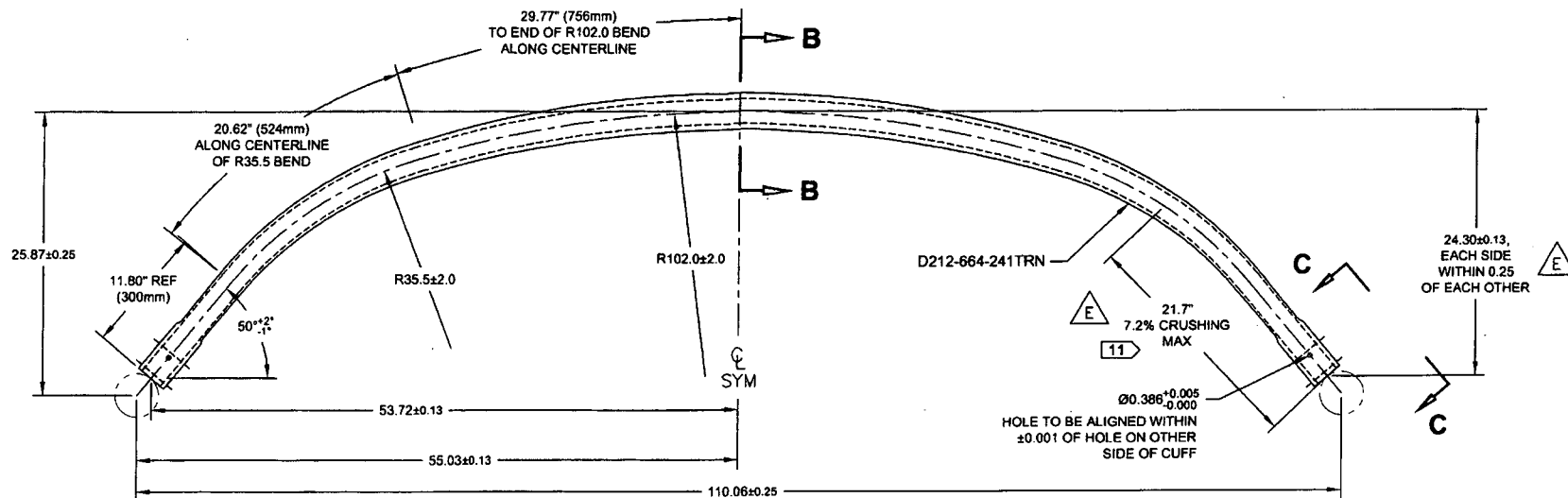


**SECTION G-G**  
SCALE 4X

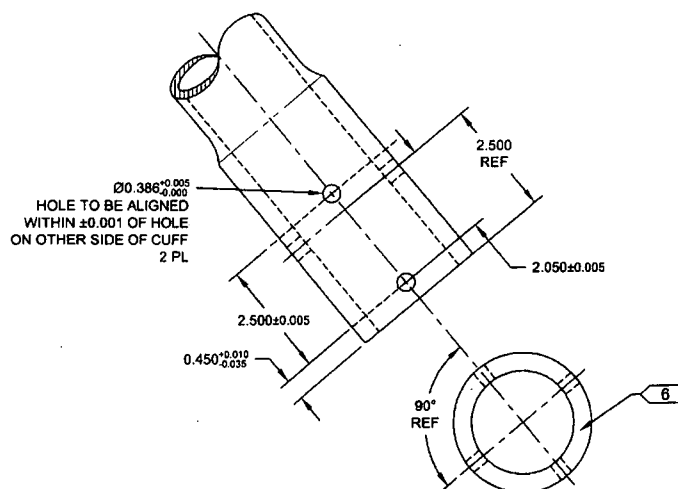
**D212-664-241B**  
**ASSEMBLY DETAIL**

RELEASED  
2014-05-26

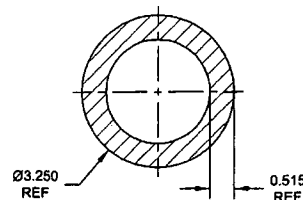
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DRAWN	Q	HAWKESBURY, ONTARIO, CANADA	
CHECKED	QW	DRAWING NO.	REV. E
MFG. APPR.	Q	D212-664-241	SHEET 3 OF 5
APPROVED	Q	TITLE	SCALE
DE APPR.	Q	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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**D212-664-601** 11  
**BENDING AND DRILLING DETAIL**



**VIEW C-C: CUFF DETAIL**  
 SCALE 3X



**SECTION B-B**  
 SCALE 4X

**RELEASED**  
 2014-05-26  
 JMD

DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	DW	DRAWING NO.	REV. E
MFG. APPR.		D212-664-241	SHEET 4 OF 5
APPROVED	11	TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
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